ATTACHMENT 1-A

POST-CLOSURE INSPECTION, MONITORING, AND MAINTENANCE OF SOLID WASTE MANAGEMENT UNITS (SWMUs)

POST-CLOSURE INSPECTION, MONITORING, AND MAINTENANCE OF SOLID WASTE MANAGEMENT UNITS (SWMUs)

The inspection, monitoring, and maintenance requirements of this plan apply to Solid Waste Management Units (SWMUs) located on the Tooele Army Depot (TEAD), as well as portions of the installation transferred in 1998 under the authority of the Base Realignment and Closure (BRAC) Act. These requirements apply to all SWMUs where engineered or administrative Institutional Controls (ICs), as well as monitoring requirements were applied to the site as part of the corrective measures implemented. ICs and monitoring requirements applied at each SWMU are fully described in the Corrective Measures Study Reports listed in Attachment 4, Section B. and Site Management Plans listed in Attachment 4, Section G. of this permit. Table 1 provides a summary of ICs and monitoring requirement at each site.

Table 1
Institutional Controls and Monitoring Requirements

SWMU #	SWMU Description	Residential Land Use Controls	Residential Deed Restrictions	Site Fencing	Site Signage	Excavation Restrictions	Soil Cover	Asphalt Cap	Ground Water Monitoring
1b	Propellant Burn Pad	•		•	•	•			
1c	Trash Burn Pits	•		•	•	•			
3	X-Ray Lagoon	•		•					
4	Sandblast Areas – Bldgs 600, 615, & 617		•						
10	TNT Washout Ponds	*Requirements to be Identified at Completion of Corrective Measures*							
11	Laundry Effluent Ponds	•							
12	Pesticide Disposal Area	•		•	•	•	•		•
15	Sanitary Landfill	•		•	•	•	•		•
19	AED Demilitarization Test Facility	•							
20	AED Deactivation Furnace Site	*Requirements to be Identified at Completion of Site Mgmt Plan*							
21	Ammo Deactivation Furnace Site	*Requirements to be Identified at Completion of Site Mgmt Plan*							
25	Battery Shop – Bldg 1252	•							
26	DRMO Storage Yard		•						
29	Drum Storage Area		•						
34	Pesticide Handling and Storage Area – Bldg 518	•							
37	Contaminated Waste Processor	•							
42	Bomb Washout Facility – Bldg 539	•		•	•	•	•		
45	Storm Water Holding Pond	•							

46	Used Oil Dumpsters – Bldg 611		•						
48	Old Dispensary	•							
49	Storm/Industrial Waste Water System		•						
50	Compressor Condensate Drains – Bldgs 613 & 619		•						
51	Chromic Acid/Alodine Drying Beds		•						
52b	Disposal Trenches		•			•			
54	Sandblast Areas – Bldgs 611 & 637		•						
56	Gravel Pit Disposal Area		•						

Monitoring Plan

1. Security

a. Post closure use of or on the SWMUs listed in Table 1, shall be used solely for industrial/commercial use, and not for residential purposes. Residential uses include, but are not limited to housing, day-care facilities, and schools. Industrial/commercial uses include, but are not limited to administrative/office space, manufacturing, and warehousing.

b. The Permittee shall protect against illegal trespassing on the SWMUs listed in Table 1 that remain on TEAD property. The entire TEAD property, which contains a number of the SWMUs listed in Table 1 shall be surrounded by a barbed wire perimeter fencing. Security on the Depot confines shall be maintained by 24-hour surveillance, and by patrolling armed security personnel In addition, access to the Depot shall be restricted and gained only through guarded gates.

2. Ground Water Monitoring

a. The Permittee shall monitor contaminants and aquifer characteristic of ground water underlying SWMU 10 – TNT Washout Ponds, SWMU 12 – Pesticide Disposal Area, and SWMU 15 – Sanitary Landfill. Monitoring shall be conducted in conjunction with the semi-annual monitoring of SWMU 2 – Industrial Waste Lagoon. The primary objectives of the ground water monitoring program shall be:

(1) To monitor the groundwater contaminant concentrations allowing for the tracking of the reduction in plume size, and the reduction of contaminant concentrations.

(2) To monitor aquifer characteristics and collect data required to determine plume stability through on-going modeling efforts.

(3) Table 1 of Attachment 1 provides a list of monitoring wells available for use under the ground water monitoring program specified in Module V of this permit. A map showing the location of available monitoring wells is provided as Figure 1 of Attachment 1. Ground water investigations are on-going at TEAD and periodically new monitoring wells are constructed. The selection of monitoring wells during semi-annual sampling events shall not be limited by wells listed in Attachment 1.

Inspection Plan

1. Land Use Inspection Requirements

a. The Permittee shall conduct semi-annual land use inspections on all sites identified in Table 1 having "Residential Land Use Restrictions" or "Residential Deed Restrictions". As part of this inspection, the Permittee shall:

(1) Verify that deed restrictions preventing any residential building construction are part of the deed for SWMUs identified in Table 1 that are located on portions of the installation transferred in 1998 under the BRAC action. Any differences between the stated land use restrictions, and those identified in Table 1 will be stated in the monitoring report.

(2) Verify that land use restrictions preventing any residential building construction are documented in the installations Master Plan for SWMUs identified in Table 1 that are located on TEAD. Any differences between the stated land use restrictions, and those identified in Table 1 will be stated in the monitoring report.

(3) The Permittee will perform a site visit and visually inspect the site, observing and noting any changed and abnormalities including soil erosion, soil color, habitat, vegetation, building construction, and digging. Any findings shall be recorded in the monitoring report.

(4) The Permittee will photograph each SWMU during the site visit and visually inspection to document the physical conditions at the site. Photographs will be labeled with the location of the photograph, direction facing, date photographed, and a description of any relevant features in the photograph. Copies of the photographs shall be included in the monitoring report.

b. Monitoring Report – The monitoring report shall be due semi-annually on April 15th and October 15th of each year. The report shall include at a minimum the following:

(1) Brief Summary

(2) Verification of restrictions in the deed or Installation Master Plan.

(3) Site Inspection Report

(4) Photographs Documenting Site Conditions.

2. SWMU - 10 TNT Washout Ponds and Maintenance

(Requirements to be identified upon completion of corrective measures)

3. SWMU 12/15 - Pesticide Disposal Area/Sanitary Landfill Inspection and Maintenance

a. The corrective measures for SWMU 12/15 include soil and vegetative cover improvements, groundwater monitoring, and land use controls. This Inspection and Maintenance Plan (IMP) is required in order to ensure that the corrective measures remain in effect over the long term.

Groundwater monitoring is being performed under a separate program, and the TEAD Land Use Master Plan incorporates the restrictions for SWMU 12/15. The focus of this IMP is the soil and vegetative cover and site security.

b. Inspection Plan

(1) SWMU 12/15 will be inspected periodically to identify and document changes in the cover and the perimeter fence as they occur. Proper observation and documentation through inspection reports will enable rapid repair of the cover or fence, should it be necessary. Inspection frequencies, procedures, and documentation are provided for the perimeter fence, erosion damage, ponded water, and vegetative cover condition. Inspection schedules are shown in Table 1. Information necessary for documentation of the inspections is listed in Table 2. An inspection form is provided as Figure 1.

(a) Perimeter Fence: The perimeter fence will be inspected semi-annually. Breaches in the fence, broken strands, or other damage will be documented on the inspection form and the approximate location will be marked on a site map. Fence repairs will be performed within 30 days after discovery of the requirement.

(b) Erosion Damage: In the semi-arid environment in which TEAD is located, erosion will occur only after intense precipitation events. TEAD or contract personnel will inspect the surface of the landfill cover on foot for evidence of erosion at mid-wet season and after wet season or within 24 hours of a storm event with precipitation greater than ¼ inch in one hour. Corrective actions will be initiated within 15 days of observations of exposed debris, loss of vegetative control due to erosion, or other erosion damage greater than 3 inches in depth.

(c) Ponded Water: TEAD or contract personnel will inspect the surface of the landfill cover on foot for evidence of ponded water at mid-wet season and after wet season or within 24 hours of a storm event with precipitation greater than ¼ inch in one hour. Infiltration through the soil cover and the buried debris may be accelerated due to increased volume of water in the ponded areas. Ponded areas of diameter greater than six feet will be documented on the inspection forms. Corrective action will be initiated as appropriate to the specific depression within 15 days of discovery of ponding.

(d) Vegetative Cover: TEAD or contract personnel will inspect the surface of the landfill cover on foot for evidence of damage to the vegetative cover semi-annually or within 24 hours of a storm event with precipitation greater than ¼ inch in one hour. Any areas showing evidence of dead, damaged, or stressed vegetation will be identified on the inspection forms, including location, size, and nature of damage. Re-planting will be performed as appropriate. The schedule for re-seeding may depend on season. Other erosion control measures may be necessary if re-planting is delayed. Monthly inspections will be made at re-planted areas until the vegetation is re-established.

(e) Unusual Conditions: In addition to documenting fence condition, erosion, ponding, and vegetation, observations of any unusual conditions will be similarly documented. “Unusual conditions” include any conditions that may adversely affect the corrective measures that are not specifically addressed in this IMP.

c. Maintenance Plan

(1) This section describes a program of corrective maintenance designed to maintain the soil cover and perimeter fence at the landfill. Plans are presented for maintenance of the perimeter fence, eroded and ponded areas, settlement of soil cover, and vegetative cover.

(a) Perimeter Fence Maintenance: Repairs to the fence may include replacing broken/missing strands of barbed wire, missing/damaged signage, tightening loose strands of barbed wire, replacing posts, replacing locks. Repair activities will be initiated within 15 days after observations of deficiency are made.

(b) Erosion Damage: On areas of minor slope, gullying is the most likely form of potential erosion damage. Corrective action will be initiated within 15 days after discovery of gullying. Re-covering and re-vegetation will be performed. Erosion control matting may also be used. At areas of significant slope, slumping may occur if the ground becomes saturated. Upon discovery of slumped areas, an engineering design for corrective action will be prepared and implemented. Corrective action will commence after review and approval of the design by a geotechnical engineer. UDEQ will be notified of all repairs required.

(c) Ponding: Subsidence in the landfill may result in observations of ponding. Additional soil will be brought in to fill the ponded areas within 15 days after discovery.

(d) Vegetation: Since vegetation, for the purpose of erosion control, is a required component of the landfill cover, a certain amount of maintenance is necessary. Since the landfill cover has no engineered barrier layers to protect, maintenance will not include control of "undesirable species". Maintenance is focused on ensuring vegetation remains viable to serve the purpose of erosion control. The need for maintenance will most likely be the result of erosion damage, or operation of equipment (drill rigs, etc.). If damage occurs, re-seeding will be the likely corrective action. In the event that die-off of vegetation is observed, investigation into the cause of the die-off will be performed before determining the corrective action. Soil amendments may be necessary before re-seeding the area. UDEQ will be notified of any revegetation activities.

Table 1
SWMU 12/15 Landfill Cover Inspection Frequency

Item	Inspection Frequency
Perimeter Fence	Semi-annual
Unusual Conditions	Semi-annual
Erosion Damage	Semi-annual/24 hr. post-precipitation
Ponded Water	Semi-annual/24 hr. post-precipitation
Vegetative Cover	Semi-annual

Table 2
SWMU 12/15 Landfill Cover Inspection Information

Item	Required Information
Perimeter Fence	Barbed wire missing/broken/loose, damaged/missing signage, damaged posts, locks, location
Unusual Conditions	Description, location
Exposed Debris	Description, location, extent
Erosion Damage	Extent, location, depth of gully/slump
Ponded Water	Size, depth, location, time since last rain
Vegetative Cover	Nature of problem, extent, location

FIGURE 1 - SWMU 12/15 LANDFILL INSPECTION FORM

Inspector: _____ Inspection Date: _____ Reviewed By: _____

Date: _____ Weather Condition: _____

INSPECTION TYPE (check one)

Semi-annual (items 1,4,5) _____ **Mid-wet season** (items 2-3) _____ **Post-wet season** (items 2-3) _____ **Monthly** (item 4) _____

Item No.	Inspection Item	Deficiency	Action Taken
1	Security Fence		
2	Erosion Damage		
3	Ponded Water		
4	Vegetative Cover		
5	Other Observations		

4. SWMU 42 – Bomb Washout Facility Inspection and Maintenance

a. The corrective measures for SWMU 42 included the consolidation of contaminated soil within the washout pond, construction of a soil cap with vegetative cover, site fencing, and land use controls. This Inspection and Maintenance Plan (IMP) is required in order to ensure that the corrective measures remain if effect over the long term. The focus of this IMP addresses the vegetated soil cover, site fencing, and signage.

b. Inspection Plan

(1) SWMU 42 will be inspected periodically to identify and document changes in the cover and the perimeter fence as they occur. Proper observation and documentation through inspection reports will enable rapid repair of the cover or fence, should it be necessary. Inspection frequencies, procedures, and documentation are provided for the perimeter fence, erosion damage, ponded water, and vegetative cover condition. Inspections will be conducted on a semi-annual basis. Information necessary for the documentation of the inspections is listed in Table 3. An inspection form is provided as Figure 2.

(a) Perimeter Fence: The perimeter fence will be inspected semi-annually. Breaches in the fence, broken strands, or other damage will be documented on the inspection form and the approximate location will be marked on a site map. Fence repairs will be performed within 30 days after discovery of the requirement.

(b) Erosion Damage: The soil cover will be inspected on foot semi-annually for evidence of soil erosion resulting from wet season run-off. Corrective actions will be initiated within 15 days of observations of erosion damage greater that 3 inches in depth or loss of vegetative cover control.

(c) Vegetative Cover: The soil cover will be inspected on foot for evidence of damage to the vegetative cover semi-annually. Any areas showing evidence of dead, damaged, or stressed vegetation will be identified on the inspection forms, including location, size, and nature of damage. Re-planting will be performed as appropriate. The schedule for re-seeding may depend on season. Other erosion control measures may be necessary if re-planting is delayed. Monthly inspections will be made at re-planted areas until the vegetation is re-established.

(d) Unusual Conditions: In addition to documenting fence condition, erosion, and vegetation, observations of any unusual conditions will be similarly documented. “Unusual conditions” include any conditions that may adversely affect the corrective measures that are not specifically addressed in this IMP.

c. Maintenance Plan

(1) This section describes a program of corrective maintenance designed to maintain the soil cover and perimeter fence at the Bomb Washout Facility. Plans are presented for maintenance of the perimeter fence, eroded areas, and vegetative cover.

(a) Perimeter Fence Maintenance: Repairs to the fence may include replacing broken/missing strands of wire, missing/damaged signage, tightening loose wire, and replacing posts. Repair activities will be initiated within 15 days after observations of deficiency are made.

(b) Erosion Damage: On areas of minor slope, gullying is the most likely form of potential erosion damage. Corrective action will be initiated within 15 days after discovery of gullying. Re-covering and re-vegetation will be performed. Erosion control matting may also be used. At areas of significant slope, slumping may occur if the ground becomes saturated. Upon discovery of slumped areas, an engineering design for corrective action will be prepared and implemented. Corrective action will commence after review and approval of the design by a geotechnical engineer. UDEQ will be notified of all repairs required.

(c) Vegetation: Since vegetation, for the purpose of erosion control, is a required component of the corrective measures, a certain amount of maintenance is necessary. Maintenance is focused on ensuring vegetation remains viable to serve the purpose of erosion control. The need for maintenance will most likely be the result of erosion damage, or operation of equipment (drill rigs, etc.). If damage occurs, re-seeding will be the likely corrective action. In the event that die-off of vegetation is observed, investigation into the cause of the die-off will be performed before determining the corrective action. Soil amendments may be necessary before re-seeding the area. UDEQ will be notified of any revegetation activities.

Table 3
SWMU 42 Bomb Washout Facility Inspection Information

Item	**Required Information**
Perimeter Fence	Barbed wire missing/broken/loose, damaged/missing signage, damaged posts, locks, location
Unusual Conditions	Description, location
Exposed Debris	Description, location, extent
Erosion Damage	Extent, location, depth of gully/slump
Ponded Water	Size, depth, location, time since last rain
Vegetative Cover	Nature of problem, extent, location

FIGURE 2 - SWMU 42 BOMB WASHOUT FACILITY INSPECTION FORM

Inspector: _____ Inspection Date: _____ Reviewed By: _____

Date: _____ Weather Condition: _____

Item No.	Inspection Item	Deficiency	Action Taken
1	Security Fence		
2	Erosion Damage		
3	Soil Cover		
4	Vegetative Cover		
5	Habitat		

5. SWMU 20 - AED Deactivation Furnace Site Inspection and Maintenance

(Requirements to be added upon completion of the site management plan)

6. SWMU 21 - Ammo Deactivation Furnace Site Inspection and Maintenance

(Requirements to be added upon completion of the site management plan)